

Remarks

1. Summary of the office action

In the office action mailed September 3, 2008, (i) the Examiner rejected claims 1-4, 9-14, 16, 18, 20-24, 27-38, 40, 41, 43, and 45-55 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,208,247 B1 (Agre) in view of U.S. Patent No. 5,483,287 (Kulka)¹, (ii) the Examiner rejected claims 2-4, 11, and 45 under 35 U.S.C. § 103(a) as being unpatentable over Agre and Kulka in view of U.S. Patent No. 5,420,825 (Fischer), (iii) the Examiner rejected claim 16 under 35 U.S.C. § 103(a) as being unpatentable over Agre and Kulka in view of *A Self Organizing Wireless Sensor Network* (Sohrabi) and in further view of U.S. Patent No. 6,028,857 (Poor), (iv) the Examiner rejected claims 20 and 21 under 35 U.S.C. § 103(a) as being unpatentable over Agre and Kulka in view of U.S. Patent No. 6,615,088 B1 (Myer), (v) the Examiner rejected claim 24 under 35 U.S.C. § 103(a) as being unpatentable over Agre and Kulka in view of U.S. Patent No. 5,742,829 (Davis), (vi) the Examiner rejected claim 30 under 35 U.S.C. § 103(a) as being unpatentable over Agre and Kulka in view U.S. Patent No. 6,233,610 B1 (Hayball), (vii) the Examiner rejected claim 31 under 35 U.S.C. § 103(a) as being unpatentable over Agre, Kulka, Hayball in view of Sohrabi, (viii) the Examiner rejected claim 33 under 35 U.S.C. § 103(a) as being unpatentable over Agre and Kulka in view U.S. Patent No. 6,414,955 B1 (Clare), (ix) the Examiner rejected claims 34 and 36-38 under 35 U.S.C. § 103(a) as being unpatentable over Agre and Kulka in view U.S. Patent No. 6,236,365 B1 (LeBlanc), (x)

¹ At page 3, lines 1-3 of the office action, the Examiner indicated claims 1-4, 9-14, 16, 18, 20-24, 27-38, 40, 41, 43, and 45-55 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Agre in view of Kulka. However, the Examiner did not address claims 2-4, 11, 16, 20, 21, 24, 30, 31, 33, 34, 36-38, 43, 45, 46, 49, and 53-55 as being obvious over Agre and Kulka, but instead used other combinations of references. Applicant treats the inclusion of claims 2-4, 11, 16, 20, 21, 24, 30, 31, 33, 34, 36-38, 43, 45, 46, 49, and 53-55 on page 3, line 1 as erroneous.

the Examiner rejected claims 43 and 46 under 35 U.S.C. § 103(a) as being unpatentable over Agre and Kulka in view U.S. Patent No. 6,809,653 B1 (Mann), (xi) the Examiner rejected claim 49 under 35 U.S.C. § 103(a) as being unpatentable over Agre and Kulka in view U.S. Patent No. 5,203,199 (Henderson), (xii) the Examiner rejected claim 53 under 35 U.S.C. § 103(a) as being unpatentable over Agre and Kulka in view of U.S. Patent No. 4,494,121 (Walter), (xiii) the Examiner rejected claims 54 and 55 under 35 U.S.C. § 103(a) as being unpatentable over Agre in view of U.S. Patent No. 5,864,323 (Berthon), and (xiv) the Examiner rejected claims 1-4, 9-14, 16, 18, 20-24, 27-38, 40, 41, 43, and 45-55 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-41 of U.S. Patent No. 6,735,630 B1.

2. Claim amendments and status of the claims

Applicant has amended claims 1, 3, 11, 12, 16, 18, 20-24, 27-38, 40, 41, 43, and 49-55, and added new claims 56-62. Claims 1-4, 9-14, 16, 18, 20-24, 27-38, 40, 41, 43, and 45-62 are pending. Of the pending claims, claims 1, 50, and 54 are independent.

Support for the amendment to claim 1 is located in the specification, for example, at (i) page 45, lines 21-23, (ii) page 46, lines 21-24, (iii) page 64, lines 12-21, (iv) page 169, original claim 1, and (v) Figures 20 and 29. Support for the amendment to claim 50 is located in the specification, for example, at (i) page 90, line 12 to page 91, line 6, (ii) page 101, lines 10-24, and (iii) Figures 41 and 42. Support for the amendment to claim 52 is located in the specification, for example, at page 101, lines 10-24, and Figure 41. Support for the amendment to claim 54 is located in the specification, for example, at page 104, lines 1-6 and Figure 43.

Support for new claim 56 is located in the specification, for example, at page 169, original claim 1. Support for new claim 57 is located in the specification, for example, at page 14, lines 13-19, and Figure 41. Support for new claim 58 is located in the specification, for

example, at (i) page 14, lines 14-16, (ii) page 98, line 16 to page 99, line 4, and (iii) Figure 41. Support for new claim 59 is located in the specification, for example, at page 98, lines 20-21, and Figure 41. Support for new claim 60 is located in the specification, for example, at (i) page 90, lines 12-24, and (ii) page 101, line 10 to page 102, line 16. Support for new claim 61 is located in the specification, for example, at page 90, line 12 to page 91, line 17. Support for new claim 62 is located in the specification, for example, at page 104, lines 1-13, and Figure 43.

3. Response to claim rejections under 35 U.S.C. § 103(a)

a. Claims 1-4, 9-14, 16, 18, 20-24, 27-38, 41, 43, 49

The Examiner rejected independent claim 1 under 35 U.S.C. § 103(a) as being unpatentable over Agre in view of Kulka. Applicant has amended claim 1 to more particularly point out and distinctly claim the subject matter that Applicant regards as the invention.

As amended, claim 1 recites, *inter alia*, a sensor node comprising a multiple-mode radio frequency modem operable to transmit on multiple channels, wherein transmission on the multiple channels allows the sensor node to simultaneously join multiple clusters of a network, and wherein each of the clusters comprises a respective base node that can communicate with one or more sensor nodes within a range of the base node.

Applicant submits that claim 1, as amended, patentably distinguishes over Agre and Kulka. Additionally, claims 2-4, 9-14, 16, 18, 20-24, 27-38, 41, 43, 49, and 56 depend from claim 1 and necessarily include all of the limitations of claim 1. Therefore, Applicant respectfully requests favorable consideration and allowance of claims 1-4, 9-14, 16, 18, 20-24, 27-38, 41, 43, 49, and 56.

b. Claims 50-53 and 57-61

The Examiner rejected claims 50-52 under 35 U.S.C. § 103(a) as being unpatentable over Agre in view of Kulka, and the Examiner rejected claim 53 under 35 U.S.C. § 103(a) as being unpatentable over Agre and Kulka in view of Walter. Claims 57-61 are new claims that depend on claim 50. Of claims 50-53 and 57-61, claim 50 are independent. Applicant has amended independent claim 50 to more particularly point out and distinctly claim the subject matter that Applicant regards as the invention.

As amended, claim 50 recites, *inter alia*, a flexible substrate that operates as an acoustic sensor and an acoustic source, wherein the acoustic sensor is used in determining a position of the sensor node, and wherein the sensor node communicates information identifying the determined position of the sensor node to the other node.

Applicant submits that claim 50, as amended, patentably distinguishes over Agre, Kulka, and Walter. Additionally, claims 51-53 and 57-61 depend from claim 50 and necessarily include all of the limitations of claim 50. Therefore, Applicant respectfully requests favorable consideration and allowance of claims 50-53 and 57-61.

c. Claims 54, 55, and 62

The Examiner rejected claims 54 and 55 under 35 U.S.C. § 103(a) as being unpatentable over Agre in view of Berthon. Claim 62 is a new claim that depends on claim 54. Of claims 54, 55, and 62, claim 54 is independent. Applicant has amended independent claim 54 to more particularly point out and distinctly claim the subject matter that Applicant regards as the invention.

Claim 54 now recites, *inter alia*, an annular ring antenna comprising at least one ring positioned on a dielectric substrate above a ground plane, wherein the processor, the at least one

sensor, and the battery are enclosed in a center region of the antenna. Applicant submits that Agre and Berthon do not reasonably lead to these elements of claim 54.

First, Agre and Berthon do not disclose or reasonably suggest an annular ring antenna comprising at least one ring positioned on a dielectric substrate above a ground plane. In rejecting claim 54, the Examiner argued that Agre teaches a sensor node comprising an antenna positioned on a dielectric substrate above a ground plane. In support of this argument, the Examiner cited to column 5, lines 7-11 of U.S. Patent No. 5,659,195 (Kaiser). Then, the Examiner indicated that Kaiser is incorporated by reference in Agre. (See, office action, page 24).

Applicant submits that Agre does not incorporate Kaiser by reference. 37 C.F.R. § 1.57 provides the requirements for incorporation by reference. Agre does not contain a claim under 37 C.F.R. § 1.55 for priority of a prior-filed foreign application, or a claim under 37 C.F.R. § 1.78 for the benefit of a prior-filed provisional, nonprovisional, or international application, and thus Agre does not incorporate Kaiser by reference under 37 C.F.R. § 1.57(a). Additionally, Agre does not express a clear intent to incorporate by reference by using the root words “incorporat(e)” and “reference” (e.g., “incorporate by reference”), as required by 37 C.F.R. § 1.57(b).

However, even if, for the sake of argument, it is assumed that Agre incorporates Kaiser by reference, Applicant submits that Agre and Kaiser do not teach or suggest an annular ring antenna comprising at least one ring positioned on a dielectric substrate above a ground plane, or even more broadly, an antenna positioned on a dielectric substrate above a ground plane, as argued by the Examiner. Agre and Kaiser, at best, discloses (i) an antenna that is mounted atop an enclosure and that is shared by a transmitter and receiver, and (ii) an electrode film is dielectrically isolated on a silicon substrate that yields an electro-to-silicon ground plane capacitance of 30 to 40 pF/mm² for a typical 1 micron dielectric thickness. (See, Agre, col. 4, line 67, col. 10, lines 57-58, and Figure 1,

and Kaiser col. 5, lines 7-11). However, these portions of Agre and Kaiser, as well as the rest of Agre and Kaiser, do not disclose or reasonably suggest an annular ring antenna comprising at least one ring positioned on a dielectric substrate above a ground plane.

In rejecting claim 54, the Examiner acknowledged that Agre does not explicitly disclose that the antenna is an annular ring antenna comprising at least one ring. (See, office action, pages 24-25). To make up for this deficiency of Agre, the Examiner argued that column 2, lines 28-29 of Berthon teaches that an antenna is an annular ring antenna comprising at least one ring. (See, office action, page 25, lines 3-5).

Berthon, at best, discloses that a need has arisen for antennas with rings, e.g., annular, cores, for use with resonant circuits, and such ring antennas may be mounted on and/or around objects, such as metallic containers, for identifying such objects. (See, e.g., Berthon, col. 2, lines 28-31). Even if Berthon is combined with Agre, Applicant submits that the disclosure of (i) a ring antenna that is mounted atop an enclosure and/or on or around objects, such as metallic containers, and that is shared by a transmitter and receiver, and (ii) an electrode film that is dielectrically isolated on a silicon substrate to yield an electro-to-silicon ground plane capacitance of 30 to 40 pF/mm² for a typical 1 micron dielectric thickness, does not amount to an annular ring antenna comprising at least one ring positioned on a dielectric substrate above a ground plane, as recited in claim 54.

Next, Agre and Berthon do not disclose or reasonably suggest that a processor, at least one sensor, and a battery are enclosed in a center region of the antenna, as recited in claim 54. In rejecting claim 54, the Examiner acknowledged that Agre does not explicitly disclose that the elements are enclosed in the interior region of the antenna. (See, office action, pages 24-25, emphasis original). Applicant believes that the "elements" the Examiner referred to are the processor, the at least one sensor, and the battery. To make up for this deficiency of Agre, the

Examiner argued that Figure 13 of Berthon teaches that the elements are enclosed in the interior region of the antenna.

Berthon discloses ring antennas for resonant circuits. (See, Berthon, title). However, even if, for the sake of argument, it is assumed that Agre and Berthon disclose (i) an annular ring antenna comprising at least one ring positioned on a dielectric substrate above a ground plane, (ii) a processor configured for wireless communication to automatically assemble into a network with other nodes using the antenna, (iii) at least one sensor coupled to provide data to the processor, and (iv) a battery to provide power for operation of the processor, Applicant submits that Agre and Berthon do not reasonably lead to the processor, the at least one sensor, and the battery being enclosed in the center region of the antenna, as recited in claim 54.

With respect to Figure 13 of Berthon, as far as Applicant can tell, Berthon discloses a steel gas cylinder 210 within a center region of antenna 120. Applicant submits a steel gas cylinder within the center region of an antenna does not amount to a processor, at least one sensor, and a battery enclosed in the center region of an antenna, as recited in claim 54.

Since Agre and Berthon do not reasonably lead to all of the limitations of claim 54, Applicant submits that claim 54 patentably distinguishes over Agre and Berthon and that claim 54 is allowable. Furthermore, because claims 55 and 62 depend from claim 54 and necessarily includes all of the elements of claim 54, Applicant submits that claims 55 and 62 are allowable as well.

4. Response to double patenting rejection

The Examiner rejected claims 1-4, 9-14, 16, 18, 20-24, 27-38, 40, 41, 43, and 45-55 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims

1-41 of U.S. Patent No. 6,735,630 B1. Of these rejected claims, claims 1, 50, and 54 are independent.

Applicant submits that claim 1, as amended, is patentably distinct over claims 1-41 of U.S. Patent No. 6,735,630 B1. At a minimum, claims 1-41 of U.S. Patent No. 6,735,630 B1 do not reasonably lead to a sensor node comprising a multiple-mode radio frequency modem operable to transmit on multiple channels, wherein transmission on the multiple channels allows the sensor node to simultaneously join multiple clusters of a network, and wherein each of the clusters comprises a respective base node that can communicate with one or more sensor nodes within a range of the base node, as now recited in claim 1. Additionally, since claims 2-3, 9-14, 16, 18, 20-24, 27-38, 40, 41, 43, and 45-49 depend from claim 1 and necessarily include all of the limitations of claim 1, Applicant submits that claims 1-41 of U.S. Patent No. 6,735,630 B1 do not render dependent claims 2-3, 9-14, 16, 18, 20-24, 27-38, 40, 41, 43, and 45-49 obvious

Applicant submits that claim 50, as amended, is patentably distinct over claims 1-41 of U.S. Patent No. 6,735,630 B1. At a minimum, claims 1-41 of U.S. Patent No. 6,735,630 B1 do not reasonably lead to a flexible substrate that operates as an acoustic sensor and an acoustic source, wherein the acoustic sensor is used in determining a position of the sensor node, and wherein the sensor node communicates information identifying the determined position of the sensor node to the other node, as now recited in claim 50. Additionally, since claims 51-53 depend from claim 50 and necessarily include all of the limitations of claim 50, Applicant submits that claims 1-41 of U.S. Patent No. 6,735,630 B1 do not render dependent claims 51-53 obvious.

Applicant submits that claim 54 is patentably distinct over claims 1-41 of U.S. Patent No. 6,735,630 B1. At a minimum, claims 1-41 of U.S. Patent No. 6,735,630 B1 do not reasonably lead to a sensor node comprising an annular ring antenna comprising at least one ring positioned on a dielectric substrate above a ground plane, wherein the processor, the at least one sensor, and the battery are enclosed in a center region of the antenna, as recited in claim 54. Additionally, since claims 55 depends from claim 54 and necessarily include all of the limitations of claim 54, Applicant submits that claims 1-41 of U.S. Patent No. 6,735,630 B1 do not render dependent claim 55 obvious.

Since claims 1-4, 9-14, 16, 18, 20-24, 27-38, 40, 41, 43, and 45-55 are patentably distinct over claims 1-41 of U.S. Patent No. 6,735,630 B1, Applicant respectfully requests that the Examiner withdraw the rejection of claims 1-4, 9-14, 16, 18, 20-24, 27-38, 40, 41, 43, and 45-55 on the ground of nonstatutory obviousness-type double patenting.

5. Conclusion

Applicant believes that all of the pending claims have been addressed in this response. However, failure to address a specific rejection or assertion made by the Examiner does not signify that Applicant agrees with or concedes that rejection or assertion.

For the foregoing reasons, Applicant submits that claims 1-4, 9-14, 16, 18, 20-24, 27-38, 40, 41, 43, and 45-62 are in condition for allowance. Therefore, Applicant respectfully requests favorable reconsideration and allowance of all the pending claims.

Respectfully submitted,

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